

Q&A with Brian David Johnson

Interviewed by Joelle Seligson

The child running around your exhibit floor may someday become a driving force for forward-thinking. That was the course for Brian David Johnson, futurist at Intel, whose job entails envisioning what's next for science and technology. To gear up for the near future—when he will deliver the keynote address at the ASTC Annual Conference (conference.astc.org) in Columbus, Ohio, this October—Johnson talked with *Dimensions* about getting rid of technological “boogeymen” and how our imaginations are the most critical tools of all.

Brian, assuming you don't have extrasensory perception, how do you go about predicting the future?

Well, the first thing I should say, Joelle, is I don't predict the future. I don't make predictions, mainly because for the work that I do, it's much more pragmatic. Usually I tell people that if somebody's coming to you and giving you a prediction for the future, you should probably be a little bit wary of them because they're probably trying to sell you something. So for me, it's really my job at Intel to look about 10 to 15 years out and develop an actionable vision for the future of computing. And the reason why we have to do that is because at Intel it takes just about 10 years to develop and design and deploy the chip. So it's really, really important today for Intel to have an understanding of how people will act and interact with technology 10 years from now. So the process that I use is called future-casting, and it's really a mix between social science and computer science and statistical science, and then I spend a lot of time outside of Intel, I spend a lot of time outside the country going and talking to people, and seeing what people are doing all over the world. The people in my lab actually call it “future-hunting.” They say, “Brian's going out future-hunting again.” If you want to see the future, you need to go to Mumbai, India. You need to go to Rio de Janeiro. You need to go to Seoul, South Korea, and see what people are doing. So a lot of my work is actually going out and testing the models and testing the things we see coming down the line.

Given you can't really predict the future, what is your hunch about three major technological developments you're foreseeing for 2022?

Well, the work that we've been doing recently—one of the areas that we've been looking at certainly is data. And everybody knows about big data and cloud computing. But for us, our models are a little bit different because we look at what it would feel like to be a human in the year 2022. And for us what that means is that for people, it'll feel like data has a life of its own. So one of the things we've been doing is called the Secret Life of Data. Because people really feel like data has its own life. And the fact of the matter is, it

will. You'll have algorithms talking to algorithms, machines talking to machines, more algorithms, more machines—and this is a good thing. We want this to happen. It'll allow us to be much more efficient. It'll allow us to do a lot more. What we always have to remember when we're designing for this, [is] that data in and of itself is meaningless until it comes back to people. So the work that we've been doing very specifically is looking at those algorithms, looking at that data and saying, "How can those algorithms have a better understanding of what people will want to do with that data, and more specifically, how can that data make people's lives better?" Which is why we use the social science work, to gain an understanding of people. And then this isn't a theoretical approach; I'm very much working on those algorithms with people. Actually, her name is Rita. So Rita and I are actually kind of working on—if you were creating an algorithm that had a better understanding of what it meant to be human, what would that look like, if you authored it in a very different way? That's one of the things we're looking at, the Secret Life of Data.

The second area that we've been looking at is something that we call the Ghost of Computing. And the reason why we call it that is there's something very, very exciting coming around the year 2020. One of the things that our silicon architects have shown me is that as we approach the year 2020, the size of meaningful computation, the size, the volume, is going to approach zero. Now if you're a geek like I am, that gives you goosebumps. Because it means that the size of meaningful computational intelligence is beginning to approach zero. Now of course batteries and all that sort of stuff are shrinking at a different rate, but still—ultimately what that says is that we can put intelligence into anything. We can put into a chair, we can put it into a shoe, we can put it into the wall—we can essentially turn anything into a computer, which really changes the questions that we have to ask ourselves as developers and designers and even future-casters. For decades, we asked ourselves: Can we do this? Can we make a mainframe computer small enough to fit on a desktop? Can we make a desktop small enough so it fits on your lap? Can we make a computer small enough that it fits in your pocket? We don't have to ask ourselves "can" anymore. What we ask ourselves is: "What?" What do we want to do? Do we want to make this water glass a computer? Where do we want to put this computational intelligence, because realistically we'll be living in an environment of computational intelligence. In effect, in many areas, it'll be like you're living inside a computer. And so, the way that then you architect that, the way that you build those systems, the way that you build the communications and the networks and the software and the services is fundamentally different than the world that we have today, so computing becomes invisible.

The final bit that we've been working on, that third area, actually has something to do with technology, but actually more to do with culture. One of the things that we've been calling the Future of Fear. Because one of the things as I travel around doing my future-hunting, when I talk to people, I talk to students, and I talk to militaries, I talk to customers, I talk pretty

much to everybody. And there's a lot of fear. When you start talking about the Ghost of Computing, the Secret Life of Data, and all this information out there, people all over the world have these very deep-seated fears. I've been raging a kind of one-man war against fear. Saying that, why are we afraid? What are we afraid of? Because a lot of times what I find out is that people create boogeymen. People create fears without information. I've tried to get people to talk about those fears and say, well, why are you afraid of this? And a lot of times it actually has nothing to do with technology at all. So one of the things that we're pushing with this Future of Fear is to say: What should we be afraid of, and what shouldn't we be afraid of? Let's identify what we shouldn't be afraid of, what's the boogeyman, what's something that really is a myth, and let's get that out of the way, then let's really focus on the things that we should be frightened of, and let's go and do the engineering work that we need to do to take care of that.

So what should we be frightened of and what's a boogeyman?

Well, a lot of people—the boogeymen are more fun, right? So you get people worried about things like the machines taking over or computers getting too smart, which I understand that people have some very real fears about that. And for me, what I always say is we always have to remember that computers and computational power and intelligence: It's just a tool. And we're the ones in control, we're the ones designing that tool. So if we don't want it to act a certain way, if we don't want it to do something, then we need to make sure that we're designing for that. That's one of the things that we do with the Tomorrow Project, which is the public-facing side of a lot of the future-casting work that we do. The Tomorrow Project really strives to generate conversations about the future, so that people can have a conversation about the future that they want and the future that they don't want. Because again, as we start to look out to 2020 and 2025, we actually have to have a vision. Everybody needs to be an active participant in the future. We need to have a vision, each one of us, and say, "OK, this is the future that we want, and this is the future that we don't want." And realizing that for many of us, we're designing those tools, we're designing those technologies, and we need to understand what people want and what they don't want. A lot of people want to make sure that there's control and that we have a healthy and honest relationship with our technology. And we can do that, we can instrument that. I think that one of things that people are really frightened of is that we don't have control. People talk about these fears, and I say, "Don't let the future happen to you." Don't just sit back and let the future happen. Be an active participant. Have a conversation about what you want and what you don't want, and your areas of fear.

We have great, wonderful, rich examples of that throughout history. Things like *1984*. *1984* is an excellent example of a work of speculative fiction, which is really more of a broader social conversation that George Orwell was looking to have. Now, people say, "We don't want Big Brother." But Big Brother is this incredibly complex idea of a totalitarian government using

technology to spy on people in their homes and control people. What we say now because this has moved up into our popular culture, we now know Big Brother—no. We don't want that. And so I think if you have more of these conversations, they become really incredibly important.

And then the other side of it is what we do need to be afraid of is—there's always going to be people with malintent. We know this. We know that as we begin to design these tools, that tools are just tools. The tools themselves—we as humans, and there's a lot of great writing on this—we as humans love to fall in love with our tools. We love to get enamored with the tool itself. Anybody who has first discovered PhotoShop for the first time understands becoming enamored with the tool itself. But what we have to remember is the effect of that tool. And when you design the tool, there are positive effects and there are negative effects. And I think the great example here is a hammer. It is impossible to design a hammer so that it can drive a nail but it cannot do harm to somebody. The very tool itself is just a tool, and you cannot design a hammer so that it can't hurt somebody but it can still drive a nail. But what we have to be very careful of is we need to look at those effects, we need to have those conversations and it's not just putting the tool out there once. One of the things that comes up quite a bit is unintended consequences in technology, and it happens all the time. I think we need to be very cognizant of that. We need to have that continuing conversation about the tools that we are creating and be very vigilant. If you continue having conversations about what are the effects of that, what are the cultural effects, what are the human effects, then ultimately we are looking to develop these technologies to make people's lives better. But we have to remain very cognizant of the fact that there are different consequences and we need to still have conversations about those.

I know that you very much value science fiction as a way of interpreting these ideas, but at the same time, it's obviously instilled some of these fears in people around the world. I know *The Matrix* took me for a spin. Why do you value science fiction so much?

Well, the first would be that I'm a geek. I've always had a love of science fiction. I'm a science fiction author as well. And in my science fiction work I've always used it as a way to prototype out ideas, to think about what I was working on. I've been doing this for almost 20 years now. Then I started sharing that process, especially when it was the more formalized future-casting process—sharing it with people. And the thing that I find really interesting about science fiction, specifically science fiction based on science fact—what happens is if you write science fiction based on science fact, it gives people an informed language to have a conversation about the future. I'm a futurist, I'm not a synthetic biologist. You're a journalist, you're not a synthetic biologist. But if I give you a science fiction story based upon science fact about synthetic biology, then you and I can actually have an informed conversation about synthetic biology, about: "Do you like this future, or do you not like this future?" And I think this is a really healthy way

to explore what we like and what we don't like, to explore our fears, to explore the futures that we would want to avoid along with the futures that we would like. For me, science fiction becomes this really powerful tool, when it's based on fact, to generate these conversations, to get people talking and to get it out there. Internally, inside of Intel, we use it very specifically as a part of our process. When I hand over the specifications for the 2019 platform, it will contain science fiction stories. Because one of the things, when you're doing engineering and you're doing development, those same science fiction stories that allowed you to have a conversation about the future—what they do on the more pragmatic side, on the engineering side, is they give you a prototype. If you do science fiction based on science fact, what you're doing is essentially looking at the human implications of that technology. Because all good stories are about people. And so you start reading these stories and you understand the human impact of the technology that you're developing. You understand the cultural, the ethical, sometimes the policy implications of what you're working on. On a developer level, we use it inside of Intel to really explore the impact of it.

Also I've been teaching and I've written a textbook on it—we teach it in universities all over the world with engineers and with designers and even with some militaries to kind of, again, get that critical thinking and that science fiction prototyping.

You talking about stories and putting these things in terms of stories does remind me of our audience, which is science centers and museums, who are always trying to tell a narrative about what's in their collections. I'm wondering how you think science centers and museums could engage this to become active participants in creating the future and involving their communities to do the same thing.

Well, it's unique that science centers and museums have a very specific and very important role. Again, you've heard me say, when we were joking before, that I'm a geek—well, I grew up going to museums—I was that kid. I was that little kid that was there asking all those questions and always trying to touch things and always trying to program the computers or pull things apart or wanting to touch the big woolly mammoth. I was that little kid. Now I will apologize to any of your readers who might have been there. But for me, all of this, all of the work that I do, is called experience model. It's what it's like to be a human with this technology. I think you have an incredible role to play because it's all about that experience. What you are architecting is an experience. Sometimes it's physical, sometimes it's online, sometimes it's a mix, but it's literally an experience, and it's an ongoing sort of physical and mental experience. And that's the thing that I think is so important, that you could begin to create these fictions, create these—I'm a strong, passionate believer that we all have to have an opinion about the future, we have to think about it. So then you can give people and offer people a place to go and explore that and all the different facets of it. I think that's very, very powerful because we don't have that very often. And especially, just

there are a lot of people who say, "Well, we could just go to the web and look things up," and no, especially when you're dealing with new subjects, especially when you're dealing with emerging subjects, or when you're dealing with kids—you need curation. You need somebody who has an opinion. I love people with opinions. People who don't have opinions are very nice but they're kind of boring, right? We want somebody who's got an opinion and says, "I'm passionate about this and here's what I think," and then you can agree, you can disagree, that's fine—that's actually a good thing. But having an opinion, having a point of view, and being able to curate and move people through the experiences I think is incredibly important. Nothing gets people more excited than science fiction and the future. So being able to pull people in with these visions and getting them to interact with it I think is incredibly powerful.

I know I, for one, am very interested to hear what you'll be discussing at the ASTC Annual Conference this October in Ohio. I'm wondering if you could give us just a teaser of what else you might discuss there.

I'm going to be looking into thinking about this idea of: How do we engage people in the future? How do we not let the future happen to them? So much of the work that I've been doing recently is fueled by a quote from our chief technology officer, our CTO—his name is Justin Rattner, at Intel. Justin, he's the CTO of Intel, right? We're 100,000 geeks, he's an uber geek, he's the geek of all geeks, right? He comes out of supercomputers, he's an incredibly good engineer—and a very nice guy, as well, I should say—but he's an incredibly good engineer. Last year we were having a conversation, talking about futurism work and he told me—he had this really great quote, that technology and science have progressed to the point where we are only limited in what we build by our own imagination. Which is incredibly powerful, right? That idea that our imagination is the problem these days. It's not engineering. It's not science. We have a deficit of imagination. And that to me is a problem, and that is a huge problem, and it's not only a problem with education, it's not only a problem with us—I think it's a problem globally that we need to engage our imagination, because science and technology is starting to outpace our imagination. And to me, that is just a shame. And I think that's one of the things I want to get into, is how do we engage that imagination, but engage it with facts, engage it with science, engage it with real life, but use it as a way to capture people's imaginations so that they can go and do things.

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